CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 90-156
NPDES NO. CA0028797

RE-ISSUANCE OF WASTE DISCHARGE REQUIREMENTS FOR:

ADVANCED MICRO DEVICES INC.,
915 DEGUIGNE DRIVE
CITY OF SUNNYVALE
SANTA CLARA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter called the Board), finds that:

1. Advanced Micro Devices Inc. (AMD), (hereinafter called the discharger) has owned and operated a semiconductor manufacturing facility since 1974 at a facility located on 915 DeGuigne Drive, Sunnyvale (See Site Location Map). By application dated December 20, 1989 the discharger has applied for issuance of waste discharge requirements and a permit to discharge waste under the National Pollutant Discharge Elimination System (NPDES).

2. The 915 DeGuigne Drive site was included on the National Priority List as a Superfund site in Update 8, September 1990.

3. Studies by the discharger show that groundwater beneath the site has been contaminated by organic solvents such as trichloroethylene (TCE), 1,1,1, trichloroethane (TCA), tetrachloroethylene (PCE), 1,2-dichloroethylene (1,2-DCE), and dichlorobenzene.

4. The discharger has installed eight groundwater extraction wells, in addition to four pre-existing sumps that were inplace to prevent water from entering the building basement. These systems extract water from the A, B and B2 aquifers to remove contaminants from the shallow groundwater. Extraction of polluted groundwater has been ongoing at this facility since 1982.

   The onsite extracted groundwater, varying from approximately 75,000 to 150,000 gpd, is combined with approximately 280,000 gpd of extracted groundwater from two offsite extraction systems controlling the offsite portion of a neighboring plume prior to treatment by an air stripping system and aqueous phase carbon (see

Groundwater Extraction System Diagram) prior to discharge to a storm drain tributary of Calabazas Creek and San Francisco Bay.

The discharger normally reuses from 40% to 50% of the total influent. The permit will be written to allow discharge of up to 432,000 gpd. This is a contingency for periods of mechanical problems and scheduled facility shutdowns. As new facilities are completed the discharger hopes to increase the volume of reuse. The increase will eventually result in reuse of approximately 80% of the total volume. Reduction of volume of groundwater extracted has been considered and data on the effect of reduction in pumping rates from key wells will be evaluated in the near future. However, modifications, to improve the efficiency of other offsite extraction systems, are scheduled for installation in 1991. These modifications may result in increased flow rates that may result in increased volumes that will offset the planned reduction of extraction.

The effluent from the treatment system has been monitored under the terms of Board Order No. 85-034. The dominant constituent of concern that has been measured in both influent and effluent is TCE. Limits are also set for other constsituents of potential concern. During normal system operation the final effluent levels are below 5.0 ppb of all VOC's including TCE.

5. The Regional Board adopted a revised Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) on December 16, 1986. The Basin Plan contains water quality objectives for Calabazas Creek and South San Francisco Bay and contains discharge prohibitions applicable to shallow water discharges in these areas.

6. The beneficial uses of Calabazas Creek and South San Francisco Bay are:

a) Contact and Non-contact water recreation
b) Wildlife habitat
c) Preservation of rare and endangered species estuarine habitat
d) Warm fresh water and cold fresh water habitat, fish spawning and migration
e) Industrial service supply
f) Shellfishing
g) Navigation
h) Ocean commercial and sport fishing
i) Agricultural water supply, and

j) Groundwater recharge

7. Effluent limitations of this Order (as shown in Table 1 below) are based on the Basin Plan, State and U.S. Environmental Protection Agency (EPA) plans and policies, best available treatment economically available (BATEA), and best technical judgement. Also considered in the determination of effluent limits were the EPA Region IX draft guidance "NPDES Permit Limitations for Discharge of Contaminated Groundwater: Guidance Document", and the San Francisco Bay Regional Water Quality Control Board Internal Memorandum dated February 16, 1990, "Proposed NPDES Permit Limits For Common Organic Pollutants Found at Service Stations and Other Groundwater Cleanup Sites."

8. The Basin Plan prohibits discharge of wastewater which has "particular characteristics of concern to beneficial uses" (a) "at any point in San Francisco Bay south of the Dumbarton Bridge" and (b) "at any point where the wastewater does not receive a minimum initial dilution of at least 10:1 or into any nontidal water, deadend slough, similar confined water, or any immediate tributary thereof."

9. The Basin Plan allows for exceptions to the prohibitions referred to in Finding 8 above when it can be demonstrated that a net environmental benefit can be derived as a result of the discharge.

10. Exceptions to the prohibitions referred to in Finding 8 are warranted because the discharge is an integral part of a program to cleanup polluted groundwater and thereby produce an environmental benefit, and because receiving water concentrations are expected to be below levels that would effect beneficial uses.

11. The Basin Plan prohibits discharge of "all conservative toxic and deleterious substances, above those levels which can be achieved by a program acceptable to the Board, to waters of the Basin." The discharger's groundwater extraction and treatment system and associated operation, maintenance, and monitoring plan constitutes an acceptable control program for minimizing the discharge of toxicants to Calabazas Creek.

12. The issuance of waste discharge requirements for the discharge is exempt from the provisions of Chapter 3 (commencing with Section 21100) of Division 13 of the Public Resources Code (CEQA) pursuant to Section 13389 of the California Water Code.

13. The Board has notified the discharger and interested agencies and persons of its intent to issue waste discharge requirements for the discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

14. The Board, in a public meeting on December 12, 1990, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED that the discharger, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, shall comply with the following:

A. EFFLUENT LIMITATIONS

1. The discharge of waste containing constituents in excess of the following limits is prohibited:

TABLE 1

Constituent	Instantaneous Maximum Limit (μg/l)
VOC's	
Trichlorofluoromethane	5.0
1,1,1-trichloroethane	5.0
Tetrachloroethylene	5.0
Trichloroethylene	5.0
1,1 Dichloroethylene	5.0
Vinyl Chloride	0.5
cis-1,2-Dichloroethylene	5.0
trans-1,2-Dichloroethylene	5.0
Methylene Chloride	5.0
Total VOC's	10.0[1]
AROMATICS	
Ethylbenzene	5.0
Dichlorobenzene	5.0
Trichlorobenzene	5.0
Xylenes	5.0
Total Petroleum Hydrocarbons	50.0

[1]Total of constituents for EPA 601 analytes

INORGANICS

Arsenic	20.0
Cadmium	10.0
Chromium (VI)	11.0
Copper	20.0
Cyanide	25.0
Lead	5.6
Mercury	1.0
Nickel	7.1
Silver	2.3
Zinc	58.0

2. The Ph of the discharge shall not exceed 8.5 nor be less than 6.5.

3. Toxicity: The survival of rainbow trout in 96-hour bioassay of the effluent as discharged shall be a median of 90% survival and a 90 percentile value of not less than 70%

B. RECEIVING WATER LIMITATIONS

1. The discharge of waste shall not cause the following conditions to exist in waters of the State at any place:

   a. Floating, suspended, or deposited macroscopic particulate matter or foam;

   b. Bottom deposits or aquatic growths;

   c. Alteration of temperature, turbidity, or apparent color beyond present natural background levels;

   d. Visible, floating, suspended, or deposited oil or other products of petroleum origin;

   e. Toxic or other deleterious substances to be present in concentrations or quantities which will cause deleterious effects on aquatic biota, wildlife, or waterfowl, or which render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentration.

2. The discharge of waste shall not cause the following limits to be exceeded in waters of the State in any place within one foot of the water surface:

a. Dissolved oxygen: 5.0 mg/l minimum. The median dissolved oxygen concentration for any three consecutive months shall not be less than 80% of the dissolved oxygen content at saturation.

b. pH: The pH shall not be depressed below 6.5 nor raised above 8.5, nor caused to vary from normal ambient pH levels by more than 0.5 units.

c. Un-ionized ammonia: 0.025 mg/l Annual Median (as N) 0.400 mg/l Maximum

3. This discharge shall not cause a violation of any applicable water quality standard for receiving waters adopted by the Board or the State Water Resources Control Board as required by the Federal Water Pollution Control Act and regulations adopted thereunder. If more stringent applicable water quality standards are promulgated or approved pursuant to Section 303 of the Federal Water Pollution Control Act or amendments thereto, the Board will revise and modify this Order in accordance with such more stringent standards.

C. PROVISIONS

1. The Discharger shall comply with all sections of this order immediately upon adoption.

2. The dischargers shall comply with the Self-Monitoring Program as adopted by the Board and as may be amended by the Executive Officer.

3. The discharger shall also notify the Regional Board if the self-monitoring program results indicate, or if any discharge activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit.

4. This Order includes all items of the attached "Standard Provisions and Reporting Requirements" dated December 1986 except A.10, B.2, B.3, C.8, and C.11.

5. Any noncompliance with a requirement of this Order shall be reported as stated in section C.10 of the "Standard Provisiionsand Reporting Requirements" referred to in C.3. above.

6. This Order expires December 12, 1995 and the discharger must file a report of Waste Discharge in accordance with Title 23, California Administrative Code, not later than 180 days in advance of such expiration date as application for issuance of new waste discharge requirements.

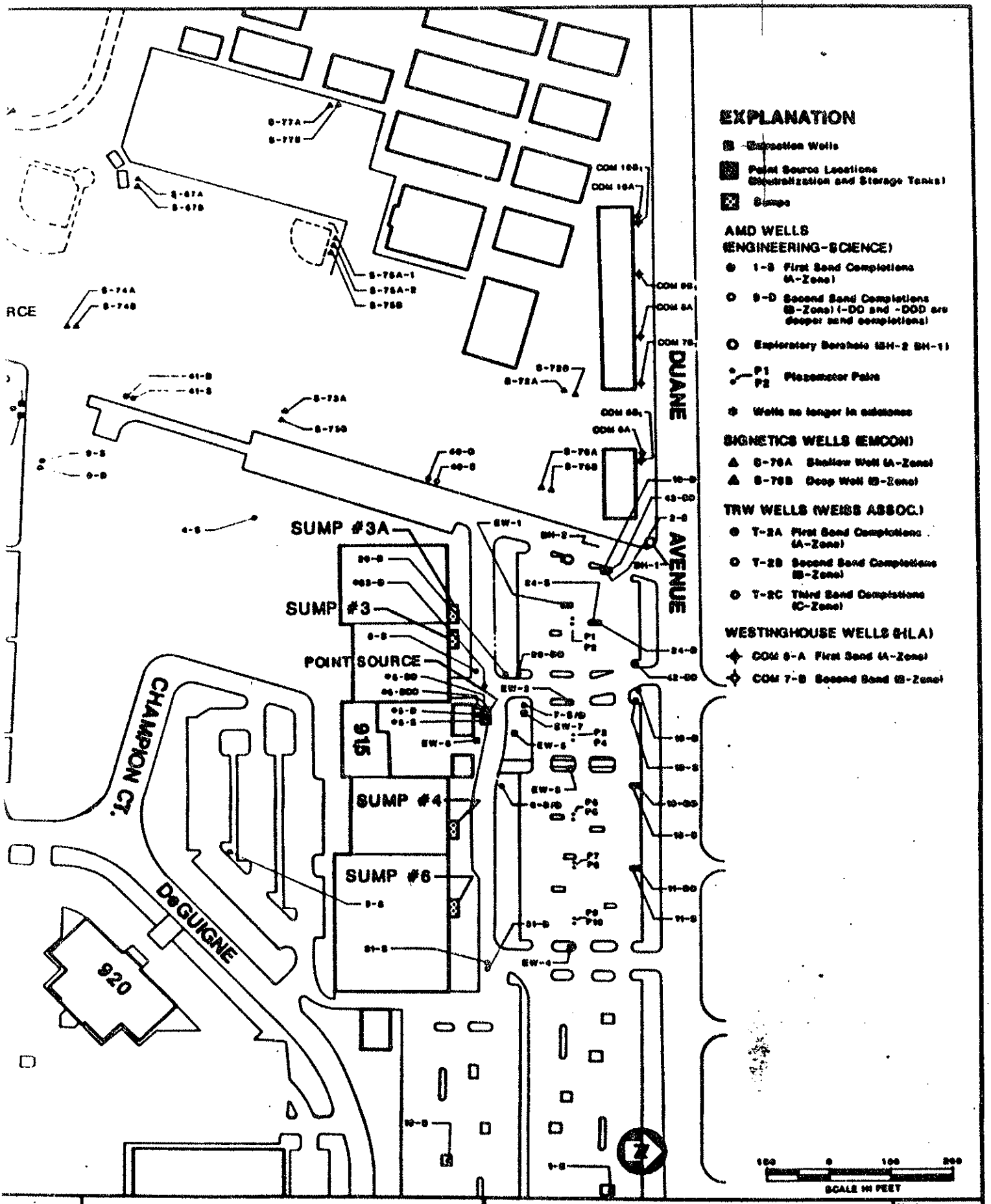
7. This Order shall serve as a National Pollutant Discharge Elimination System permit pursuant to Section 402 of the Federal Water Pollution Control Act, or amendments thereto, and shall become effective at the end of ten days from date of hearing provided the Regional Administrator, U. S. Environmental Protection Agency, has no objection.

8. Order Number 85-034 is hereby rescinded.

I, Steven R. Ritchie, Executive Officer do hereby certify the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region on December 12, 1990.

STEVEN R. RITCHIE
Executive Officer

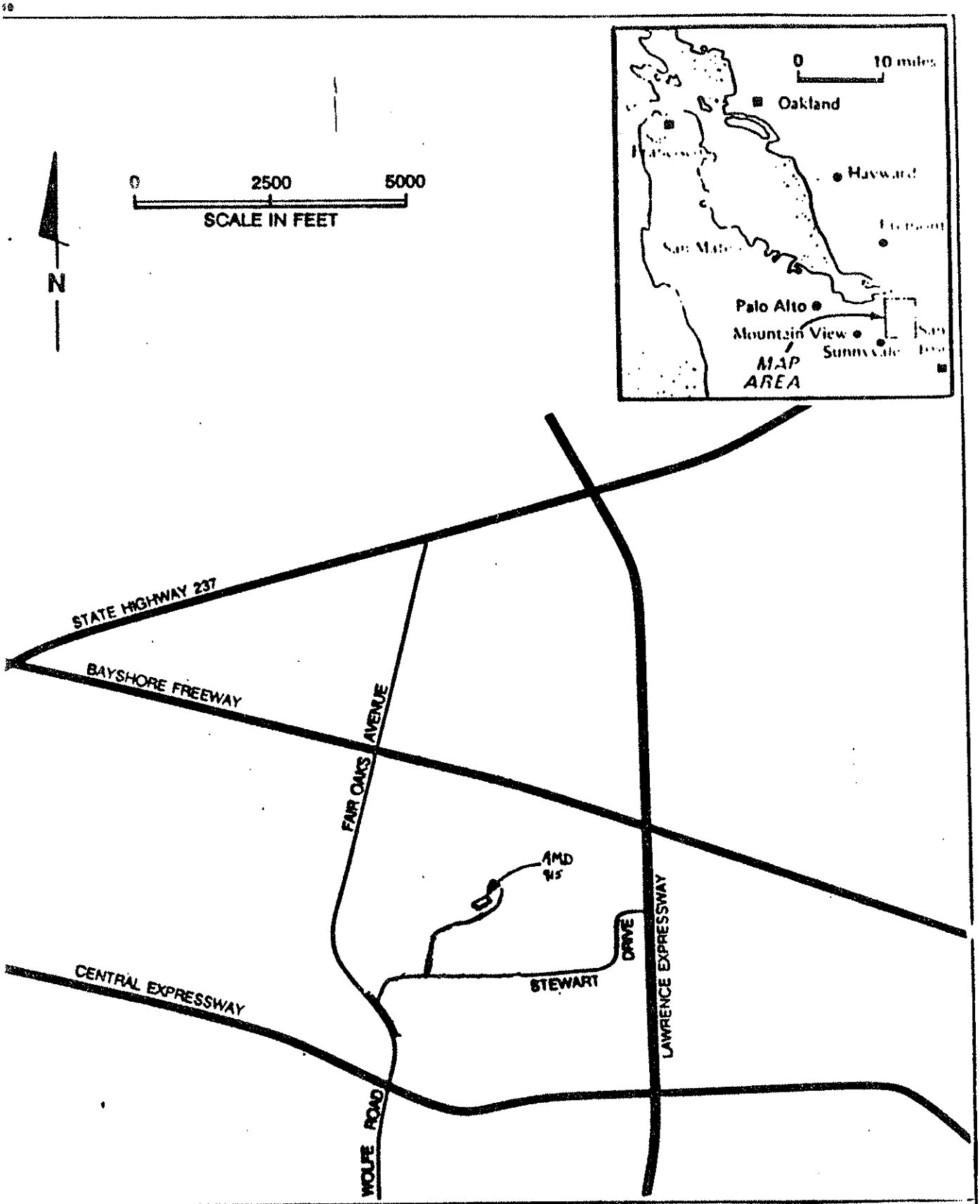
Attachments: Groundwater Extraction System
Standard Provisions and Reporting Requirements - December 1986
Self-Monitoring Program - December 1986



ADVANCED MICRO DEVICES
Sunnyvale, California

PROJECT SITE

FIG. 1.2

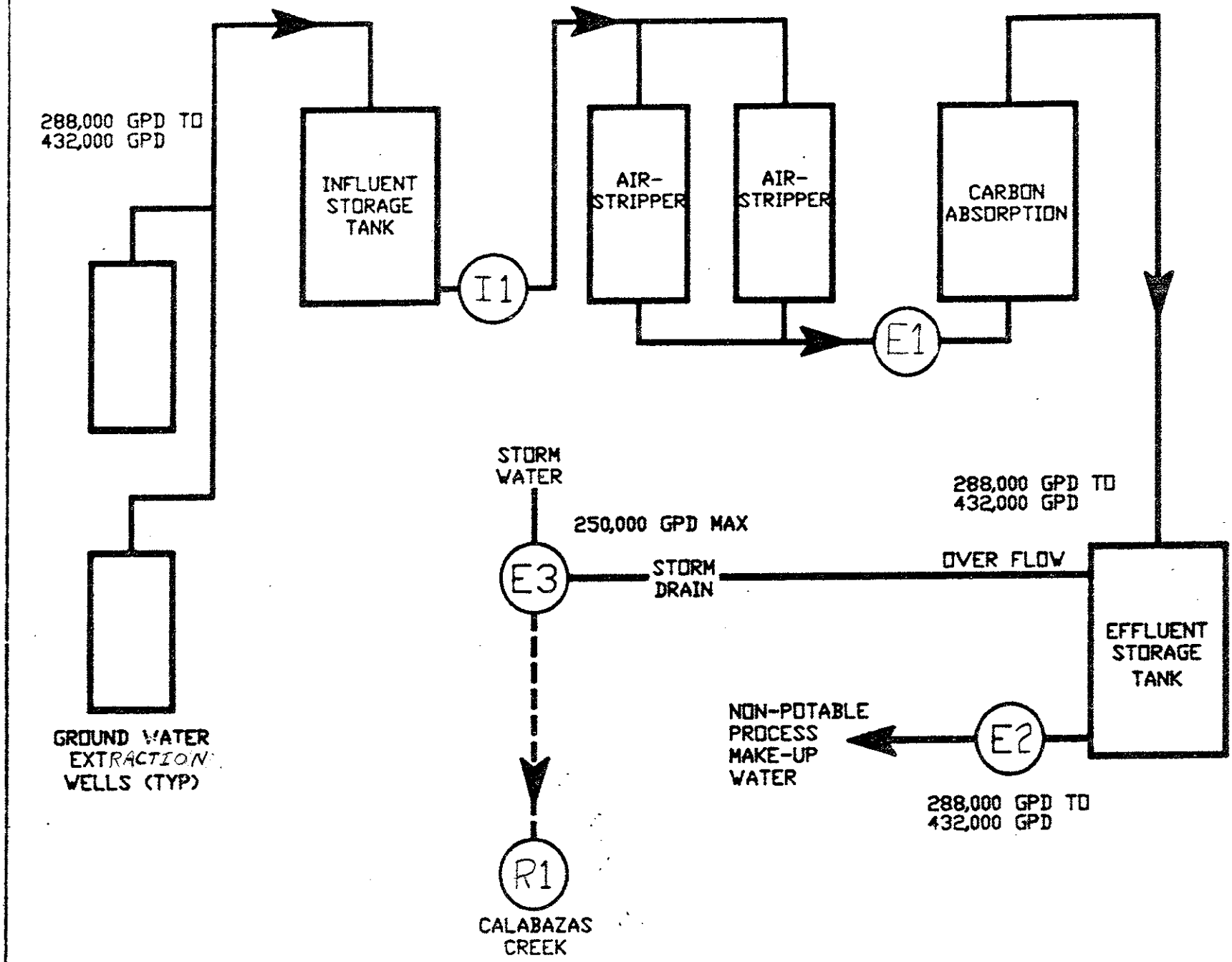


Harding Lawson Associates
Engineers and Geoscientists

Location Map
RI/FS Work Plan
The Companies
Sunnyvale, California

A1.1-1

DRAWN	JOB NUMBER	APPROVED	DATE
M	17279,086.02	[illegible] F	6/88


288,000 GPD TO
432,000 GPD
INFLUENT
STORAGE
TANK
I1
AIR-
STRIPPER
AIR-
STRIPPER
CARBON
ABSORPTION
E1
STORM
WATER
250,000 GPD MAX
E3
STORM
DRAIN
288,000 GPD TO
432,000 GPD
OVER FLOW
EFFLUENT
STORAGE
TANK
GROUND WATER
EXTRACTION
WELLS (TYP)
NON-POTABLE
PROCESS
MAKE-UP
WATER
E2
288,000 GPD TO
432,000 GPD
R1
CALABAZAS
CREEK

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

TENTATIVE

SELF-MONITORING PROGRAM

FOR

ADVANCED MICRO DEVICES, INC.
915 DEGUIGNE DRIVE
SUNNYVALE, SANTA CLARA COUNTY

NPDES NO. CA0028797

ORDER NO.

CONSISTING OF

PART A, dated December 1986 and modified January 1987, including Appendices A through E

PART B, Adopted:December 12, 1990

PART B

I. DESCRIPTION OF SAMPLING STATIONS

A. INFLUENT

Stations	Description
I-001	At a point in the extraction system immediately prior to discharge into the treatment unit.

B. EFFLUENT

Stations	Description
E-001	At a point between the air-stripper towers and the carbon adsorption treatment unit.
E-003	At a point in the discharge line immediately prior to discharge into the storm drain tributary of Calabazas Creek.
R-001	At a point in the storm drain tributary prior to its flow into Calabazas Creek, and within 200 feet of the discharge point.

II. SCHEDULE OF SAMPLING AND ANALYSIS

A. The schedule of sampling and analysis shall be that given in Table I.

III. MISCELLANEOUS REPORTING

If any chemical additives are proposed to be used in the treatment of extracted groundwater, it shall be reported thirty (30) days prior to their use and documented in the regular quarterly reports.

IV. MODIFICATION TO PART A

A. Deletions:

Sections D.1.a., D.2.a., D.2.f., D.2.g., D.2.h., D.3., E.1.e., E.3., E.4. , and F.2.b.

B. Modifications:

1. D.2.a. Samples of effluent shall be collected at times coincident with influent sampling unless otherwise stipulated. The Regional Board or Executive Officer may approve an alternative sampling plan if it is demonstrated that expected operating conditions warrant a deviation from the standard sampling plan.

2. D.2.d If two consecutive samples of any one constituent or parameter monitored on a weekly or monthly basis in a 30 day period exceed the effluent limit or are otherwise out of compliance , or if the required sampling frequency is once per month or less and the sample or parameter exceeds the limit or is otherwise out of compliance, the discharger shall implement correction procedures acceptable to or approved by the Board or Executive Officer, on a case by case basis.

3. D.2.e. If any instantaneous maximum limit is exceeded, within twenty-four (24) hours of receiving the analytic results indicating the violation, a confirmation sample shall be taken, with analytic results known within twenty-four (24) hours. In the case that the same instantaneous limit is violated in the second sample, the discharge shall be terminated until the cause of the violation is found and corrected.

4. F.2.a. Total flow shall be recorded at least weekly.

5. G.4. Written reports as required under G.4. shall be submitted based on a calendar quarter basis, not later than 30 days following the last day of the quarter.

6. G.4.b. The report format shall be in a form acceptable to the Executive Officer of the Regional Board.

7. G.4.e. The report format shall be in a form acceptable to the Executive Officer of the Regional Board. NPDES Discharge Monitoring Report, EPA Form 3320-1, is provided as guidance.

8. G.5. The annual report shall contain all data required for the fourth quarter in addition to summary data required for annual reporting. This report may be submitted in lieu of the report for the fourth quarter of a calendar year.

I, Steven R. Ritchie, Executive Officer, hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedure set forth in the Regional Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in Regional Board Order No. 89-146.

2. Was adopted by the Board on December 12, 1990.

3. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the discharger and revisions will be ordered by the Executive Officer or Regional Board.

STEVEN R. RITCHIE
EXECUTIVE OFFICER

Attachment: Table 1

TABLE I
SCHEDULE FOR SAMPLING, MEASUREMENTS, AND ANALYSIS

Sampling Station	I-1	E-1	E-2	R-1		
TYPE OF SAMPLE	G	G	G	G		
Flow Rate (mgd)	cont					
BOD, 5-day 20°, or COD (mg/l & kg/day)			A			
Chlorine Residual & Dosage (mg/l & kg/day)						
Settleable Matter (ml/1-hr. & ft^3/day)						
Total Dissolved Solids (mg/l)	Q		Q	Q		
Oil and Grease (mg/l & kg/day)						
Bio-assay 96-hr % survival (flow-through or static)			Y			
Ammonia Nitrogen (mg/l & kg/day)			V			
Nitrate Nitrogen (mg/l & kg/day)						
Nitrite Nitrogen (mg/l & kg/day)						
Total Organic Nitrogen (mg/l & kg/day)						
Total Phosphate (mg/l & kg/day)						
Turbidity (NTU's)						
pH (units)	M	Q	M	Q		
Dissolved Oxygen (mg/l and % saturation)						
Temperature (°C)	Q	Q	Q	Q		
Apparent Color						
Inorganics, Basin Plan, Table IV-1	Y		Y			

Sampling Station	I-1	E-1	E-2	R-1		
TYPE OF SAMPLE	G	G	G	G		
EPA 601 (w/FREON 113)	Q	Q	M	Q		
EPA 602						
EPA 624*	Y	Y	Y	Y		
EPA 625						
EPA 8015 (Modified TPH and Diesel)						

LEGEND FOR TABLE I

TYPES OF SAMPLES

G = grab sample
C-24 = 24 hr. composite
Cont. = continuous sampling
DI = depth integrated sample
BS = bottom sediment sample
O = observation

TYPES OF STATIONS

I = intake or influent stations
E =effluent sampling stations
D = discharge point sampling stations
R = receiving water sample stations
L = basin and/or pond levee stations
B = bottom sediment station
G = groundwater station

FREQUENCY OF SAMPLING

E = each occurrence
H = once each hour
D = once each day
W = once each week
M = once each month
Y = once each year
2/H = twice per hour
2/W = 2 days per week
5/W = 5 days per week
2/M = 2 days per month
2/y = once in March and once in September
Q = quarterly, once in March, June, September, and December
2H = every 2 hours
2D = every 2 days
2W =every 2 weeks
3M = every 3 months
Cont = continuous
V = varies; total ammonia nitrogen shall be analyzed and unionized ammonia calculated whenever fish bioassay test results fail to meet the specified percent survival

* When water samples are tested by EPA Method 624, it is not necessary to test the samples by EPA Method 601.